SE (comp) SEM III (CBSGS) NOV-DEC 2013
Data Structures

15-11-2013-DTP-P-8-KG-14

Con. 8613 -13.

4/12/13

GX-12113

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **three** questions out of remaining **five** questions.
(3) Make **suitable** assumptions wherever **necessary** but **justify** your assumptions.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Explain linear and non-linear data structures with examples. **5**
(b) Explain various techniques of graph representations. **5**
(c) Write a 'C' program to convert decimal to binary using any appropriate data structure you have studdied. **7**
(d) Define ADT with an example. **3**

2. (a) What is Huffman Coding. Construct the Huffman Tree and determine the code for the following characters whose frequencies are as given :- **10**

Characters	A	B	C	D	E
Frequency	20	10	10	30	30

(b) Write a program in 'C' to evaluate a postfix expression. **10**

3. (a) Write a program in 'C' to implement a circular queue. The following operations should be performed by the program :- **12**
(i) Creating the queue.
(ii) Deleting from the queue.
(iii) Inserting in the queue.
(iv) Displaying all the elements of the queue.
(b) Sort the following elements using Radix Sort :- **8**
121, 70, 965, 432, 12, 577, 683.
What is the limitations of Radix Sort?

TURN OVER

4. (a) Write a 'C' program to create a "Single Linked List" ADT. The ADT should support the following functions :- **12**

   (i) Creating a Linked List.

   (ii) Inserting a node after a specific node.

   (iii) Deleting a node.

   (iv) Displaying the list.

   (b) Explain various graph traversal techniques with examples. **8**

5. (a) Discuss AVL trees. Insert the following elements in a AVL search tree :- **10**

   27, 25, 23, 29, 35, 33, 34

   (b) Using linear probing and quadratic probing insert the following values in a hash table of size 10. Show how many collisions occur in each technique :- **10**

   99, 33, 23, 44, 56, 43, 19

6. (a) Explain indexed sequential search with a suitable example. What are the advantages and disadvantages of indexed sequential search? **10**

   (b) Write a program in 'C' for deletion of a node from a Binary Search Tree. The program should consider all the cases. **10**
